

### Abstract of the Disclosure

A network communication device including port control circuitry for controlling packet flow between the ports of the device, where the port control circuitry includes a port manager that directs packets between the ports and port bonding circuitry that bonds two or more of the ports into a bonded port set. For each packet to be sent via the bonded port set, the port bonding circuitry selects one of the bonded ports for transmitting the packet. More than one bonded port set may be defined in a given communication device, and each bonded port set may include from two ports up to all the ports of the device, as long as each port is included in only one bonded port set. One or more port bonding registers are provided to identify which of the plurality of ports are bonded in each bonded port set. In one embodiment, the bonded ports are selected on a packet by packet basis so as to achieve a relatively even distribution of packets sent by each bonded port. In an alternative embodiment bonded ports are assigned to packet source identifiers so as to achieve a relatively even distribution of source identifiers among the bonded ports. If bonded ports are assigned to particular source identifiers, then the traffic is preferably monitored and the assignments are periodically adjusted to achieve even distribution of packet flow on the bonded link. The bonded ports may have different bandwidths, in which case traffic is distributed on a proportionate basis.